

REMARKS

The Applicants thank the Examiner for his careful analysis of the instant application. Claims 1-27 and 30-43 stand rejected and claims 29 and 44-46 are objected to. The Applicants have amended the claims as shown above and submit that in light of the forgoing amendments and following comments, the application is now in proper form for allowance.

The Examiner has rejected claims 1-16, 41-42 and 44 under 35 U.S.C. §112, ¶2 as being indefinite for failing to point out and distinctly claim the subject matter. The Applicants have amended claim 1 to recite that the metal containing substrate is within the mixing vessel and at least a portion of the hepatocytes are attached to the metal containing substrate. The Applicants have amended claim 16 to provide proper antecedent basis for "the bioreactor" in line 8. Claims 16 and 41 have been amended to state that at least a portion of the hepatocytes become attached to the metal containing substrate. This limitation was considered acceptable by the Examiner in claim 26. Claim 42 has been cancelled. The Applicants submit that the amended claims now distinctly point out the subject matter to be claimed, thus the rejection under 35 U.S.C. §112, ¶2 is traversed.

The Examiner has rejected claims 1-2, 7-8, 12, 14-21, 24-27, 32, 35, 37-38 and 41-42 under 35 U.S.C. §103(a) for being unpatentable over Olumide et al. in view of US Patent 4,963,490 granted to Churchouse et al. Olumide et al teach an artificial liver apparatus comprising many of the same elements as the instant invention; however the hepatocytes of Olumide are unattached. Churchouse teaches the attachment of hepatocytes on a porous anodic aluminum oxide membrane support. The Applicants submit that the combination of the references is improper as there is no motivation to combine the references. There is no suggestion in Olumide to grow the hepatocytes on a solid support. Moreover, the membranes of Churchouse could not be used in a vessel such as that of Olumide or the instant invention. The supports of Churchouse

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are membranes and need to be supported in devices shown in the figures. The membranes are flexible and could readily fold onto themselves, block outflow of solutions from the vessels, etc. A rejection of claims under 35 U.S.C. §103(a) requires a reasonable expectation of success. The Applicants submit that one would not have a reasonable expectation of success upon combining Olumide and Churchouse.

The Applicants have amended the independent claims in the case, claims 1, 16, 26 and 41 to include a means or step for the circulation of the hepatocytes attached to a metal containing substrate by use of an alternating magnetic field. As the membrane of Churchouse is composed of aluminum, it would not be susceptible to forces exerted by a magnetic field. Therefore, the use of the magnetic field is not obvious over the combination of Olumide and Churchouse. This was stated by the Examiner by his objection to, rather than rejection of claims 29 and 44-46 that recite the limitation of the inclusion of the presence or use of an alternating magnetic field. By incorporation of each of these dependent claims into their corresponding independent claims, the Applicants submit that the claims are no longer obvious in view of the prior art and should be allowed. As all of the remaining claims are dependent, either directly or indirectly on the newly amended claims, they are also not obvious in view of the prior art. Therefore the rejection of claims 1-2, 7-8, 12, 14-21, 24-27, 32, 35, 37-38 and 41-42 under 35 U.S.C. §103(a) is traversed.

The Examiner has rejected claims 3-6, 9, 11, 22-23, 30-31, 33 and 43 under 35 U.S.C. §103(a) as being unpatentable over Olumide in view of Churchouse further view of US Patent 5,043,260. Claims 10 and 34 are rejected under 35 U.S.C. §103(a) as being unpatentable over Olumide in view of Churchouse further in view of US Patent 4,335,994. Claims 13 and 36 are rejected under 35 U.S.C. §103(a) as being unpatentable over Olumide in view of Churchouse further in view of US Patent 5,001,607. Claims 39-40 are rejected under 35 U.S.C. §103(a) as being unpatentable over Olumide in view of Churchouse further view of Arnaout et al. The Applicants have

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amended the claims as set forth above. As all of the remaining claims are dependent on the now allowable claims, all of the rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) are traversed.

FEES

It is believed that no fee is due with this response. However, if a fee is due, the Commissioner is hereby entitle to charge Deposit Account 02-4070 referencing case number 7728-PA01.

CONCLUSIONS

The Applicants submit that in light of the forgoing amendments and comments that all of the objections and rejections have been overcome or traversed and that the application is now in the proper form for allowance. If any outstanding issued remain that could be resolved by a telephone conference, the Examiner is encouraged to telephone the Agent for Applicant at the number below.

Respectfully submitted,

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By:

Colleen
Colleen J. McKiernan, PhD
Attorney for Applicant
Registration No. 48,570

BROWN MARTIN HALLER & McCLAIN LLP
1660 Union Street
San Diego, California 92101-2926

Telephone: (619) 238-0999
Facsimile: (619) 238-0062

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